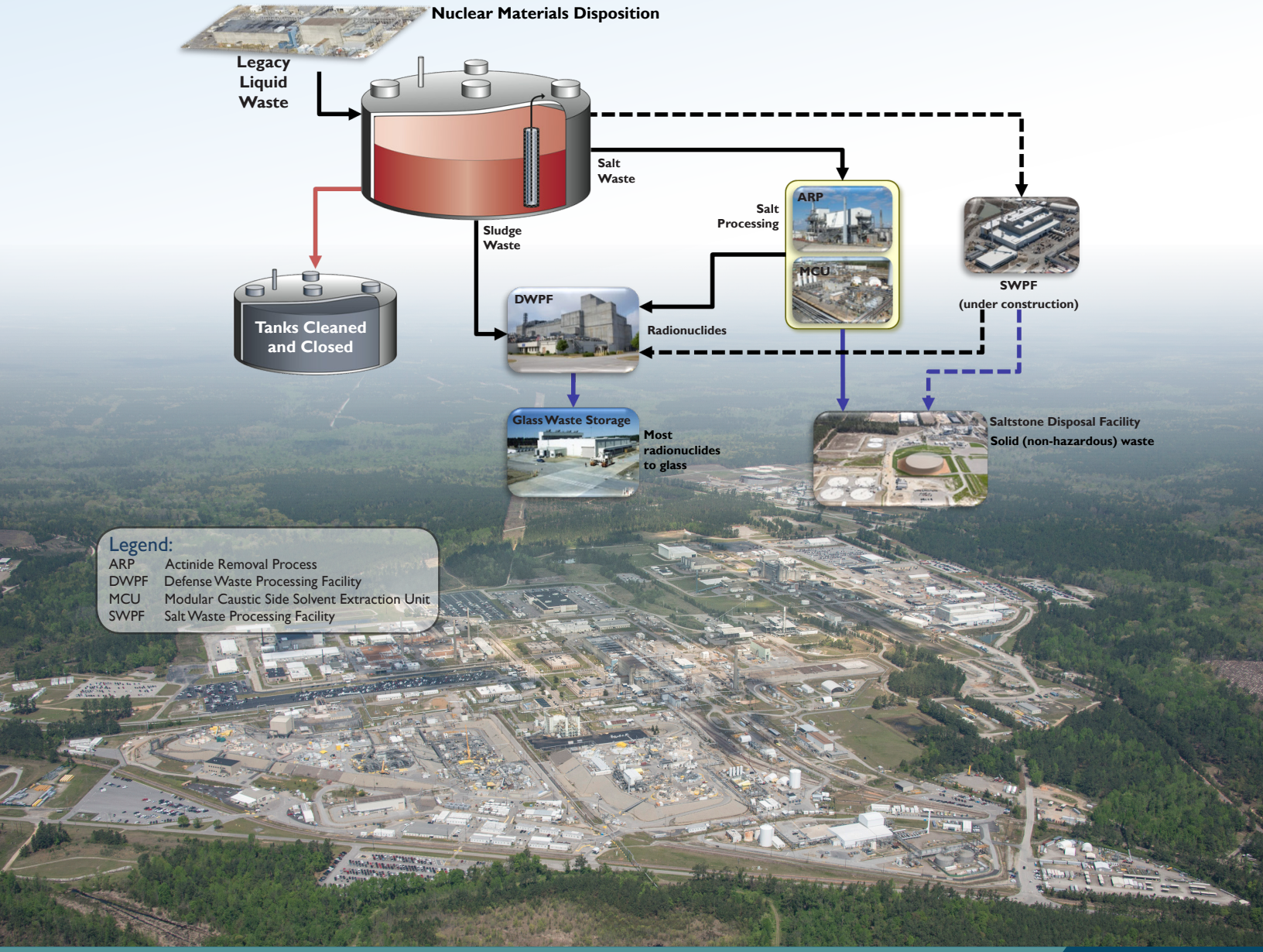
FACT SHEET

Radioactive Liquid Waste Facilities

Liquid radioactive waste is generated at the Savannah River Site (SRS) as byproducts from the processing of nuclear materials for national defense, research, and medical programs. The waste, totaling about 36 million gallons, currently is stored in 43 underground carbon-steel waste tanks grouped into two "tank farms" at SRS.

Savannah River Remediation's (SRR) Liquid Waste Program consists of high hazard operations; which includes complex engineering, procurement, construction, and the closing of waste tanks. Below is a summarized diagram of the process.



Savannah River Remediation LLC manages the Savannah River Site's Liquid Waste contract for the U.S. Department of Energy. SRR is dedicated to the reduction of risks through safe stabilization treatment, and disposition of legacy radioactive waste.

WE DO THE RIGHT THING

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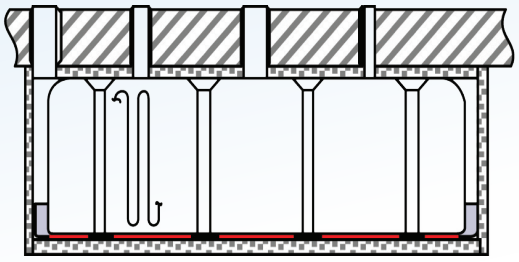
FOUR TYPES OF WASTE TANK DESIGNS

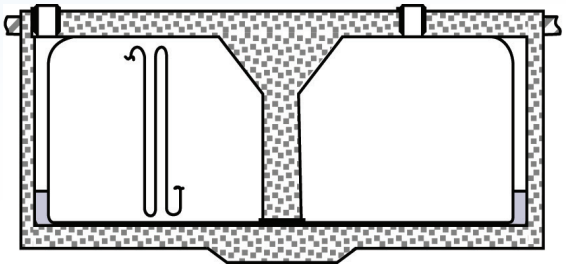
Type I Tanks

- 12 tanks; built between 1951-53
- 750,000 gallon capacity; 75 feet in diameter by 24.5 feet high
- Partial secondary containment with leak detection
- 9 tanks contain about 3.5 million gallons of waste
- 5 of these tanks still storing waste have leaked into the annulus space: the amount of waste stored in these tanks is kept below the known leak sites that have appeared over the decades of operation, and there are no active leak sites
- 3 Type I tanks are operationally closed and grouted



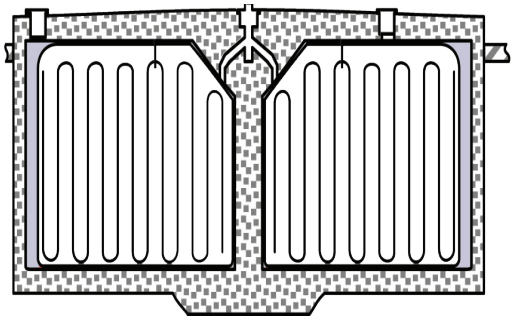
Type II Tanks

- 4 tanks; built between 1955-56
- 1 million gallon capacity; 85 feet in diameter by 27 feet high
- Partial secondary containment with leak detection
- 3 contain a total of about 1 million gallons of waste
- All tanks have leaked waste into the tank annulus
- 1 has been operationally closed and grouted



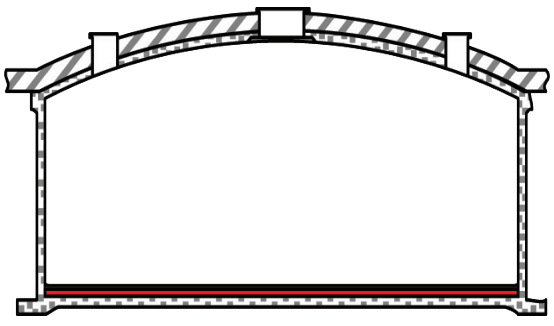
Type III/IIIA Tanks

- 27 tanks were built between 1969-81
- 1.3 million gallon capacity; 85 feet in diameter by 33 feet high
- Most modern tank farm design at SRS, including heat stress relief on the tank walls to prevent cracking
- Full height secondary containment with leak detection
- Contain about 28 million gallons of waste
- None have leaked



Type IV Tanks

- 8 tanks were built between 1953-63
- 1.3 million gallon capacity; 85 feet in diameter by 34.5 feet high
- No secondary containment
- No leaks in active tanks
- Contain about 4 million gallons of waste
- 4 tanks are operationally closed and grouted



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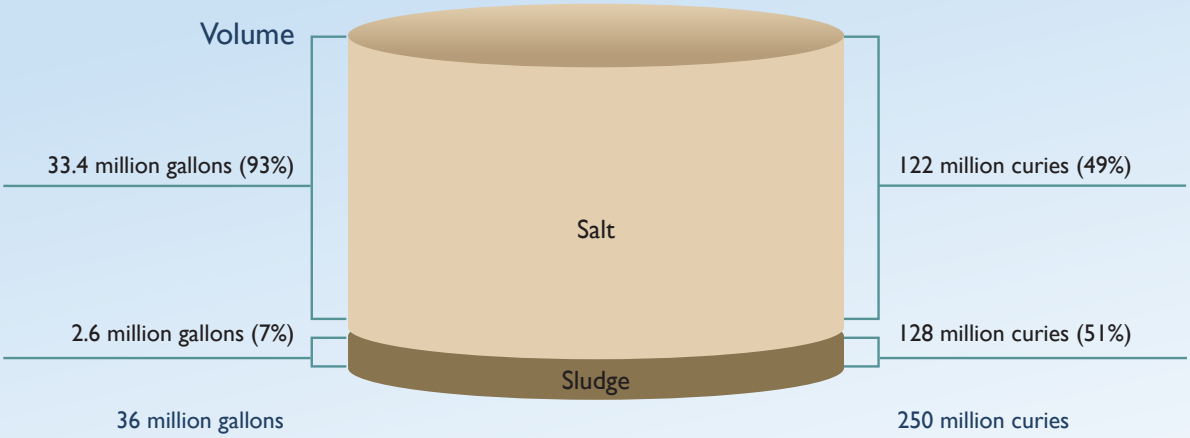
TOTAL INVENTORY OF 43 TANKS

as of December 31, 2015



EVAPORATORS

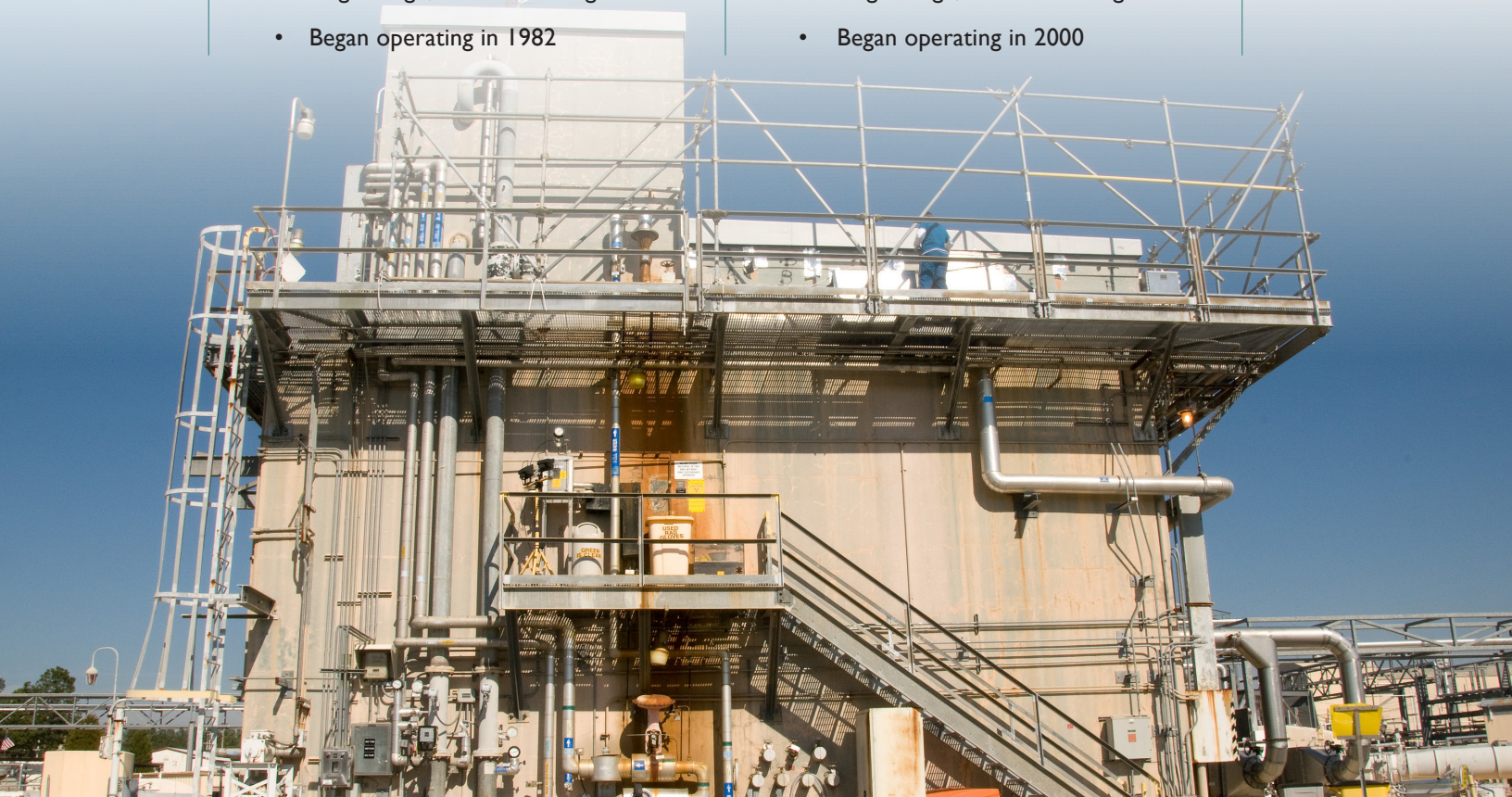
While the waste is stored in the tanks, a sludge settles on the bottom of the tank and a liquid salt waste resides on top of the sludge. The waste is reduced to about 30 percent of its original volume by evaporation. The condensed evaporator "overheads," or water removed from the waste, are transferred to the Effluent Treatment Facility for final cleanup prior to release to the environment. As the concentrate cools, a portion of it crystallizes, forming solid salt waste.

2H Evaporator, located in H Area

- Single-stage, bent-tube design
- Began operating in 1982

3H Evaporator, located in H Area

- Single-stage, bent-tube design
- Began operating in 2000



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DEFENSE WASTE PROCESSING FACILITY

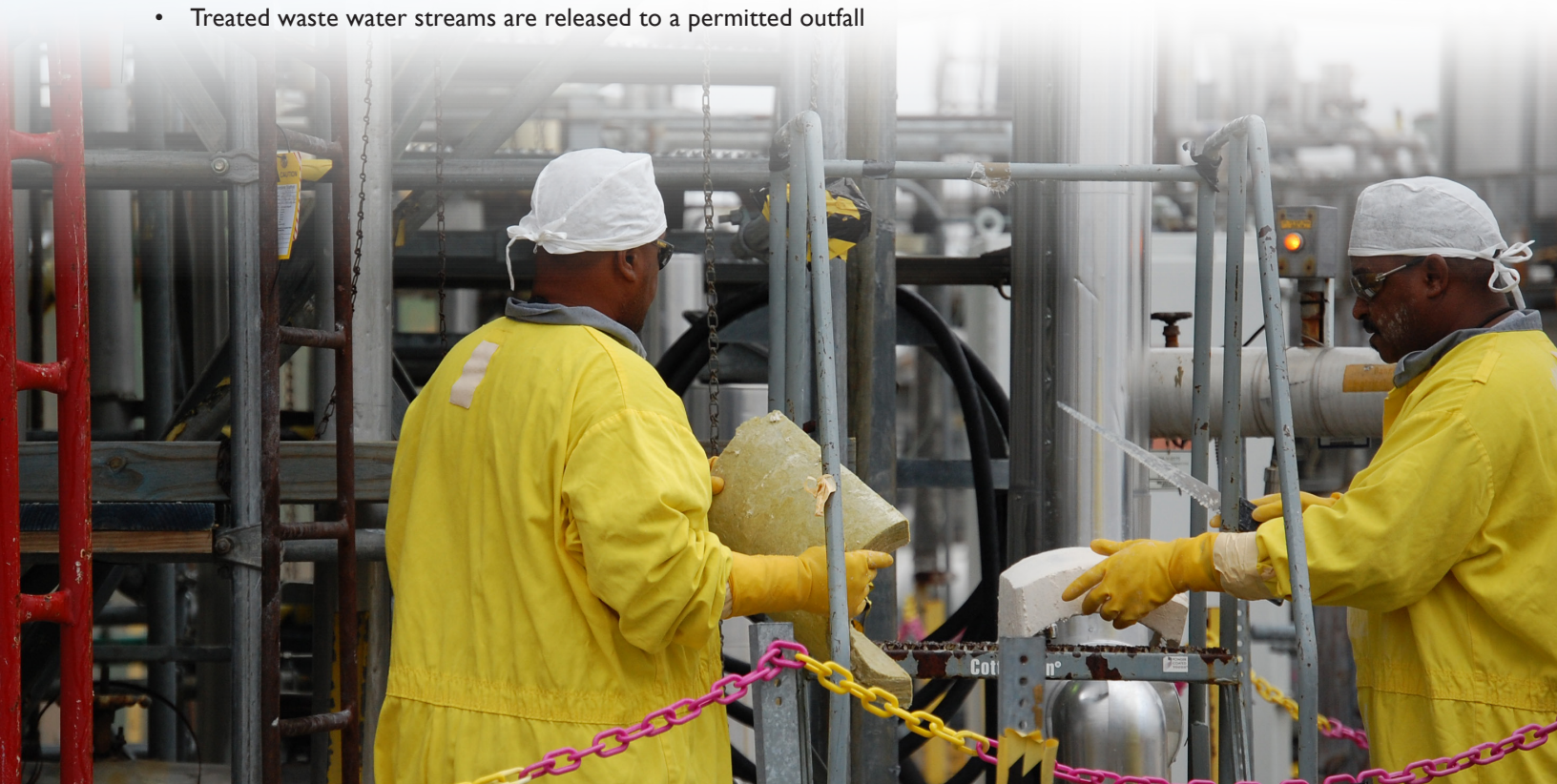
The Defense Waste Processing Facility (DWPF), located in S Area, immobilizes the radioactive waste by vitrifying it into a solid glass waste form.

- The waste and borosilicate glass "frit" are mixed together forming melter feed for the DWPF melter.
- The waste/glass mixture is fed to a melter and heated to approximately 2,100 degrees Fahrenheit (1,150 degrees Celsius).
- The molten glass is poured into stainless steel canisters to cool and harden.
- Each canister is 10 feet tall and 2 feet in diameter.
- The canisters are sealed, decontaminated on the outside, welded shut, and stored onsite in a building designed for safe interim storage until a Federal repository is available.
- DWPF has poured more than 4,000 canisters since processing radioactive waste began in March 1996.

EFFLUENT TREATMENT FACILITY

The Effluent Treatment Facility, located in H Area, treats the low-level radioactive wastewater that was formerly sent to seepage basins in accordance with a State regulatory permit. Treated streams include evaporator overheads, segregated cooling water, contaminated surface water runoff, transfer line catch tank streams, and others.

- Began operating in 1988
- Processes approximately 10 million gallons of wastewater per year
- Treatment processes include pH adjustment, filtration, organic removal, reverse osmosis, and ion exchange
- Treated waste water streams are released to a permitted outfall



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SALT WASTE PROCESSING

Removing salt waste, which occupies 93 percent of the usable tank space in the SRS tank farms, is a major step toward emptying the Site's remaining 43 high-level waste tanks that contain approximately 36 million gallons of waste.

Interim Salt Processing

Interim salt waste processing facilities have been developed that integrate a set of salt-decontamination steps designed to eliminate nearly all of the radioactive isotopes of salt solution until the Salt Waste Processing Facility (SWPF) becomes operational, which is targeted for 2018.

This interim salt processing is being performed in two facilities, both initiating operations in April 2008.

Actinide Removal Process (ARP)

ARP removes radioactive contaminants, such as plutonium and strontium, by adding a chemical that attaches itself to the radioactive particles and can then be filtered out. The radioactive portion is transferred to DWPF, where it is mixed with sludge waste and molten glass and poured into 10-foot-tall stainless steel canisters which will be welded shut and temporarily stored until they can be shipped to an off-site federal repository. The remaining filtered salt solution is then sent to Modular Caustic Side Solvent Extraction Unit.

Modular Caustic Side Solvent Extraction Unit (MCU)

Using principles involving centrifugal force and a special engineered solvent, MCU divides the high-activity salt solution into two waste streams. The cesium is removed and sent to DWPF. The remaining decontaminated salt waste solution is disposed of into the Saltstone Production Facility, by mixing it with dry cement-like materials to form a grout for safe, permanent disposal in engineered vaults.

Salt Waste Processing Facility (SWPF)

The Salt Waste Processing Facility (SWPF) will process the majority of the Site's salt waste inventory. SWPF will treat highly radioactive salt solutions currently stored in underground tanks at SRS and prepare these solutions for ultimate disposition. SWPF will use processes similar to those found within ARP and MCU, but on a larger scale.

SWPF will separate key high-activity radionuclides from the low-activity salt waste using proven separation technologies of filtration and centrifugal contractors. After separation, the high-activity salt waste is mixed with sludge waste and molten glass and poured into 10-foot-tall stainless steel canisters, which will be temporarily stored onsite until a Federal repository is chosen. The remaining high-volume/low-activity salt waste will be treated and disposed of by the Saltstone Production Facility. This dual-track approach reduces the number of DWPF canisters to be filled and the facility's associated lifecycle costs.

Lessons learned from ARP and MCU processing experiences are evaluated and factored into the design and operation of the SWPF.

Saltstone Facility

The Saltstone Production Facility treats and permanently disposes of low-level liquid waste by stabilizing it in a solid, cement-based waste form.

- Liquid waste is combined with a dry blend of cement, slag, and fly ash.
- The resulting mixture is referred to as "grout."
- The grout is pumped to above-ground engineered Salt Disposal Units, where it solidifies into "saltstone."
- Saltstone is a non-hazardous waste form.

This facility has been modified to accommodate higher radioactivity levels in support of the interim salt processing strategy.

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CLOSING WASTE TANKS

As waste is retrieved from tanks for treatment, the tanks are emptied and cleaned in preparation to be operationally closed by filling with grout. The U.S. Department of Energy, S.C. Department of Health and Environmental Control, U.S. Environmental Protection Agency, Nuclear Regulatory Commission, SRS workers and the public are working closely together to implement strict closure requirements that support all state and federal regulations for tank closure.

Safely closing waste tanks involves an intricate set of steps that includes emptying the waste tanks of bulk waste,then removing as much of the remaining heel waste as practical through various technologies and techniques, and demonstrating that the closure is protective of human health and the environment. Once those steps are complete, the tanks can be filled with grout, a cement-like material created especially for these waste tanks. This grouting process is designed to secure the tank and protect the environment.

For more information about the liquid waste program at SRS, please visit:
https://www.youtube.com/watch?v=tfeqYt1KX_o
https://www.youtube.com/watch?v=vHoOu8MLsCc

SRR is the Liquid Waste contractor at SRS, which is owned by the U.S. Department of Energy. SRR is composed of a team of companies led by AECOM with partners Bechtel National, CH2M and BWX Technologies, Inc.